

NEW SPECIES OF MICROCADDISFLIES FROM THE EASTERN UNITED STATES (INSECTA: TRICHOPTERA: HYDROPTILIDAE)

STEVEN C. HARRIS¹

Research Associate, Section of Invertebrate Zoology

JAN L. SYKORA

Research Associate, Section of Invertebrate Zoology

ABSTRACT

Three new species in the genus *Hydroptila* and one in the genus *Mayatrachia* from the eastern United States are described and illustrated: *Hydroptila koryaki* and *H. fowlesi* from West Virginia, *H. homochitta* from Mississippi, and *M. tuscaloosa* from Alabama.

INTRODUCTION

Although the caddisfly fauna of the eastern United States has been fairly well studied, ongoing collecting continues to reveal undescribed species. This paper describes four new species of microcaddisflies from West Virginia, Mississippi, and Alabama, three in the genus *Hydroptila* and one in the genus *Mayatrachia*. The Hydroptilidae, or microcaddisflies, include the smallest species of Trichoptera, ranging in size from 1.2 to 6 mm. They are also the most speciose of all North American families with over 300 species (Morse, 1993), nearly one-third of which are in the genus *Hydroptila*. The genus *Mayatrachia* is much less species-rich with only five species known from North America (Morse, 1993).

Terminology used in the descriptions follows that of Marshall (1979). Specimen length was measured from the tip of the head to the end of the wings and is given as a range when more than one specimen was available. Type material will be deposited at the Carnegie Museum of Natural History (CMNH); the National Museum of Natural History, Smithsonian Institution (NMNH); the Illinois Natural History Survey (INHS); the Florida State Collection of Arthropods (FSCA); Mississippi State University, Department of Entomology (MSU); and the collections of the authors (SCH and JLS).

SYSTEMATIC ENTOMOLOGY

Hydroptila koryaki, new species
(Fig. 1-4)

Diagnosis.—This species, a member of the *H. waubesiana* group, superficially resembles *H. ouachita* Holzenthal and Kelley and *H. cheaha* Harris in the spinose eighth segment and forked tenth tergum. Members of the *H. waubesiana* group, in general, are characterized by a short ventromesal process on Segment VII and a highly modified tenth tergite which may bear sclerotized hooks, elongate processes, curved rods, or sclerotized strips. The new species is easily recognized by

¹ Department of Biology, Clarion University, Clarion, Pennsylvania 16214.
Submitted 28 April 1995.

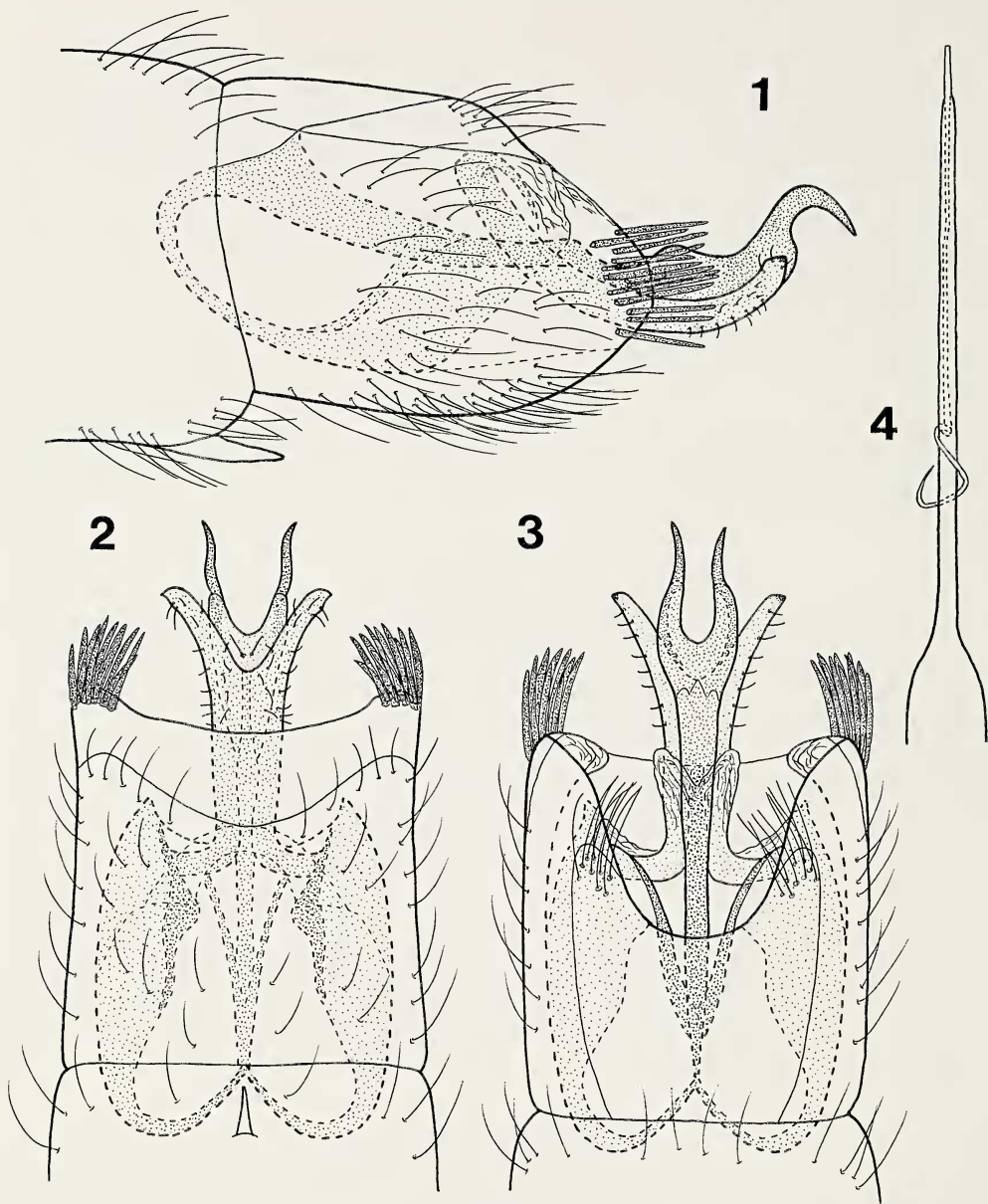


Fig. 1-4.—*Hydroptila koryaki* n. sp., male genitalia. 1, left lateral view; 2, ventral view; 3, dorsal view; 4, phallus, ventral view.

the thin, curved inferior appendages which are fused mesally and the elongate tenth tergum which is hooked in lateral aspect.

Description.—Male: length 2.6 mm. Antennae 26-segmented. Color brown in alcohol. Sternite of abdominal Segment VII with short apicomesal process. Segment VIII narrowing posteriorly in lateral view, bearing numerous heavy setae at the apical margin; slightly emarginate in ventral view; deeply incised dorsally

with pair of small setose lobes, heavy spines laterally. Segment IX completely retracted within Segment VIII, generally quadrate in shape, incised slightly both anteriorly and posteriorly. Segment X elongate, extending nearly to posterior Segment VII; in lateral view narrowing apically to sclerotized, downturned hook, with dorsal hump subapically; in dorsal view narrow basally, divided apically into pair of thin, sinuate processes. Inferior appendages thin and elongate in lateral aspect, curving dorsad; in ventral view fused mesally, narrow basally, divided into two diverging arms distally each with sclerotized point on outer apical margin, pair of stout setae subapically; in dorsal view basally with narrow sclerotized bands laterally which join anteriorly. Phallus long and narrow, paramere encircling shaft before midlength; ejaculatory duct protruding at apex.

Female: unknown.

Type Specimens.—Holotype, male (CMNH): West Virginia, Lewis County, Right Fork of the West Fork River, Walkersville, 17 July 1993, light trap, J. L. Sykora. Paratypes: same, 13 July 1992, Shawn Campbell, 3 males (NMNH, SCH, JLS).

Etymology.—Named for Michael Koryak from the U. S. Army Corps of Engineers who selected the site where this species was collected.

Remarks.—Under the dissecting microscope (50 \times), Segment VIII in lateral view appears to narrow distally much as in *H. waubesiana* Betten, but this is an illusion created by the lateral curving of the segment. The species was collected adjacent to a small, slow-flowing stream composed mostly of pools with very few riffles. The stream is affected by human activity as it flows through a rural community and by farming activities, as evidenced by open grazing, erosion, and possibly animal wastes. Other species of *Hydroptila* collected at this site included *H. amoena* Ross, *H. grandiosa* Ross, *H. hamata* Morton, and *H. fowlesi* n. sp.

Hydroptila fowlesi, new species
(Fig. 5–8)

Diagnosis.—This species, a member of the *H. tineoides* group of Marshall (1979), is most similar to *H. sandersoni* Mathis and Bowles and other members of the *H. amoena* complex. Members of this complex have in common a long apicomesal process from the seventh sternum, beak-like inferior appendages, and a phallus divided into two apical processes. The new species is distinguished by the triangular shape of the tenth tergum and by the structure of the phallus, which is divided into apical processes unequal in length.

Description.—Male: length 2.8 mm. Antennae 27-segmented. Color brown in alcohol. Venter of abdominal Segment VII with long apicomesal process. Segment VIII annular, with venter longer than dorsum. Segment IX deeply excised anteriorly in dorsal and ventral views; laterally with thin posterior lobe bearing numerous setae along posterodorsal and ventral margins, apodeme long and narrow extending to middle of Segment VII; square in dorsal view, incised at margins; in ventral view shallowly incised on posterior margin, bearing numerous setae laterally and submesally; internally with bilobed process bearing pair of setae posteriorly. Tergite X triangular, wide basally tapering to rounded apex, anteriorly fused to Segment IX; in lateral view sharply upturned basally. Inferior appendages beak-like, each with dorsolateral thumb-like projection bearing three setae on posterior margin, ventral projection tapering ventrad to sharp apex; fused along meson with wing-like lateral extensions in ventral view. Phallus with basal and

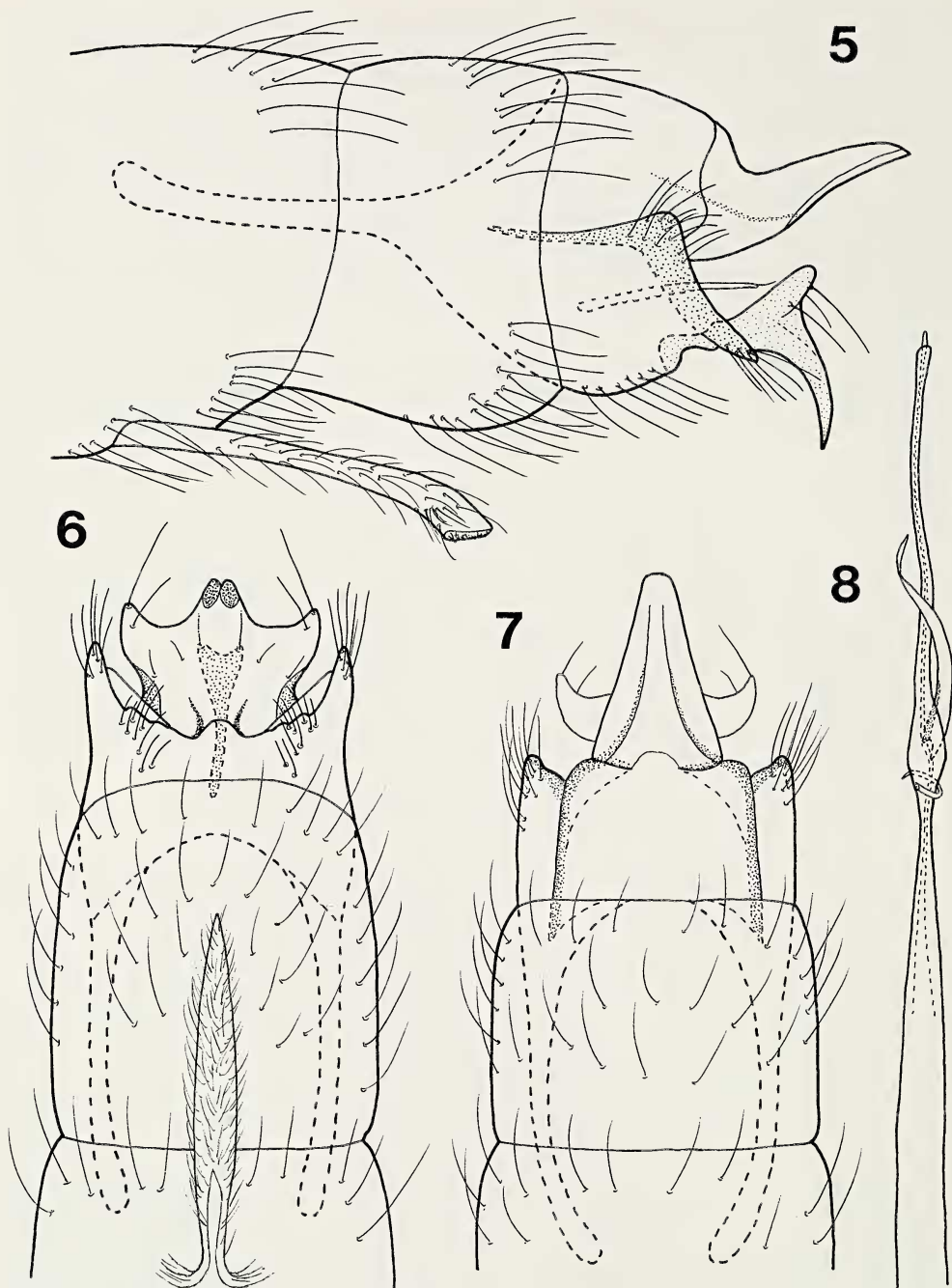


Fig. 5-8.—*Hydropstila fowlesi* n. sp., male genitalia. 5, left lateral view; 6, ventral view; 7, dorsal view; 8, phallus, ventral view.

apical portions equal in length, with short paramere making nearly one revolution at midlength, apical portion divided into two thin processes; process bearing protruding ejaculatory duct straight and twice as long as sheath-like second process.

Female: unknown.

Type Specimen.—Holotype, male (CMNH): West Virginia, Lewis County, Right Fork of the West Fork River, Walkersville, 13 July 1992, light trap, Shawn Campbell.

Etymology.—Named for J. M. Fowles from the U. S. Army Corps of Engineers who organized the light trap sampling program.

Remarks.—That several species having a phallus divided into two straight apical processes would key to *H. amoena* was first recognized by Harris (1985) with the description of two closely related species. Two additional species were described by Mathis and Bowles (1990), who also presented a key to the five species in the complex and discussed characteristics separating the species. With the addition of another species, the key of Mathis and Bowles is appended as follows:

Amended Key to *H. amoena* complex

- 1. Aedeagus short, less than one-third as long as abdomen; phallic process lacking ejaculatory duct with apex flattened and pointed (Mathis and Bowles, 1990:fig. 4) *H. artesa*
- 1a. Aedeagus longer, greater than one-third as long as abdomen; apical process not as above (Fig. 8) 2
- 2. Apex of Tergite X entire (Fig. 7) 2a
- Apex of Tergite X excised (Harris, 1985:fig. 8E) 3
- 2a. Tergite X narrow, nearly parallel-sided basally in dorsal view (Mathis and Bowles, 1990:fig. 9); Segment X directed caudad in lateral view (Mathis and Bowles, 1990:fig. 10); phallus with distal portion at least twice as long as base, apical processes equal in length (Mathis and Bowles, 1990:fig. 11) *H. sandersoni*
- 2b. Tergite X wide basally, tapering distally in dorsal view (Fig. 7); Segment X upturned in lateral view (Fig. 5); phallus with distal portion equal in length to base, apical processes unequal in length (Fig. 8) *H. fowlesi*

Hydroptila homochitta, **new species**
(Fig. 9–12)

Diagnosis.—This species, a member of the *H. waubesiana* group of Marshall (1979), is distinguished from the similar *H. cretosa* Harris and *H. lonchera* Blickle and Morse by the long, thin processes from the venter of Segment X. Such intermediate appendages are found in several southeastern members of the *H. waubesiana* group, including *H. oakmulgeensis* Harris, *H. tridentata* Holzenthal and Kelly, and *H. poirrieri* Holzenthal and Kelley, but in these species the structures tend to be sickle-shaped rather than long and narrow as in *H. homochitta*. The club-shaped, serrate apex of the tenth tergum is also diagnostic for the new species.

Description.—Male: length 2.3–2.6 mm. Antennae 25-segmented. Color brown in alcohol. Venter of Segment VII with short, posteromesal process. Segment VIII rounded posteriorly in lateral view; in dorsal view deeply emarginate posteriorly; slightly emarginate on posterior margin in ventral aspect. Segment IX retracted within Segment VIII, rounded anteriorly in lateral view; in dorsal and ventral view anterior margin deeply incised, truncate posteriorly, and fused with Segment X. Tergum X rectangular in dorsal view, cleft distally with sclerotized spinal process at apex; in lateral view wide basally, narrowing at midlength, then widening to rounded apex with numerous sclerotized serrations on posterodorsal mar-

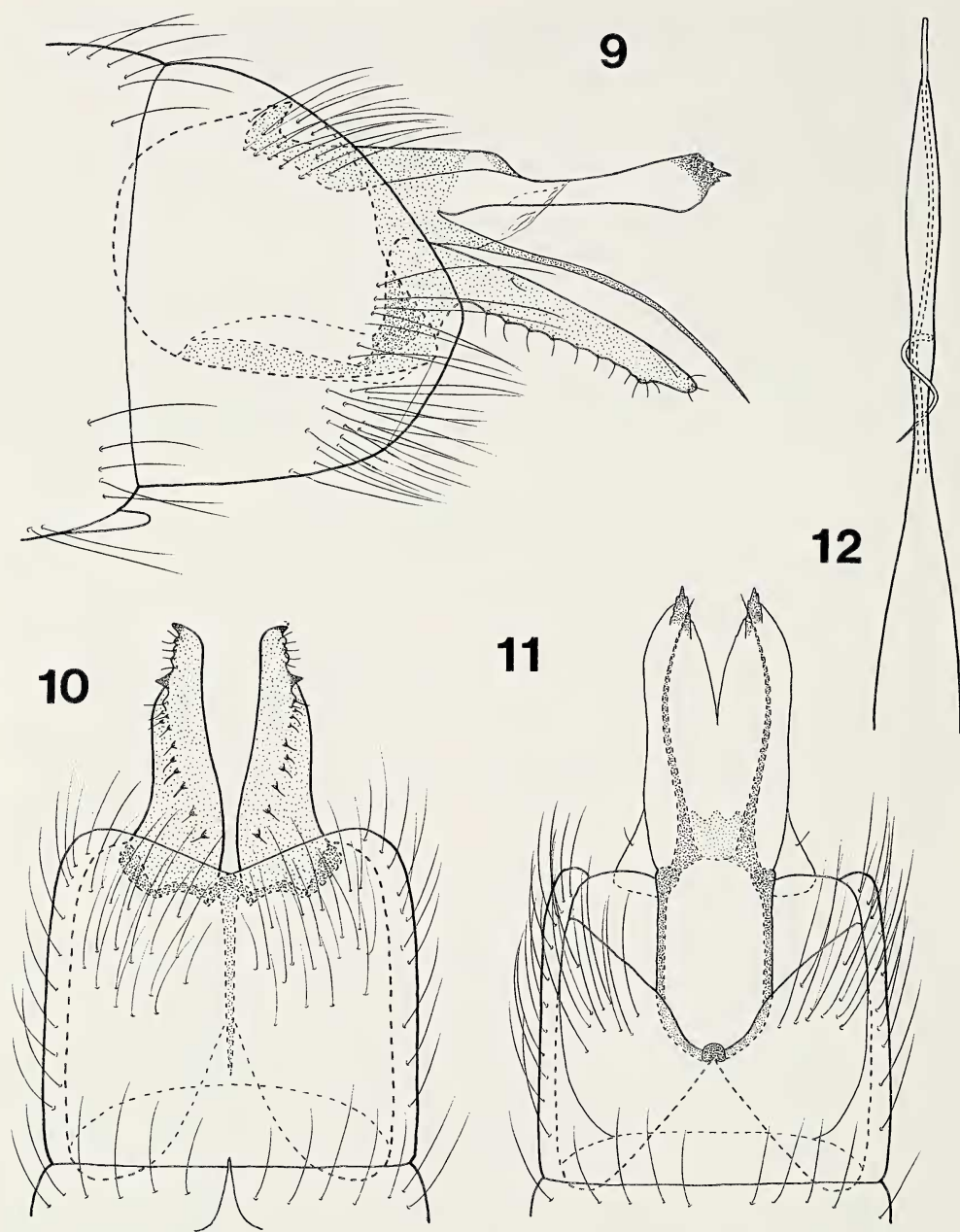


Fig. 9-12.—*Hydroptila homochitta* n. sp., male genitalia; 9, left lateral view; 10, ventral view; 11, dorsal view; 12, phallus, ventral view.

gin, ventral margin produced into thin, elongate sclerotized processes (intermediate appendages) extending beyond Tergum X and curving ventrad. Inferior appendages lightly sclerotized; in lateral view nearly parallel-sided, dorsal margin straight, ventral margin irregular and bearing numerous setae, narrowing apically to rounded tip; in ventral view wide basally and gradually tapering distally, sclerotized points apically and subapically on outer margin, series of stout setae directed laterad on ventral surface. Phallus long and narrow, widening basally and subapically, ejaculatory duct protruding at apex, thin paramere encircling shaft at midlength.

Female: unknown

Type Specimens.—Holotype, male (CMNH): Mississippi, Franklin County, Porter Creek, (T5N, R4E, S8NW), 29 June 1992, T. Schiefer and R. Fontenot. Paratypes, same, 16 males (NMNH, INHS, CMNH, MSU, SCH, JLS); same, but 27 July 1992, 7 males (NMNH, INHS, FSCA); Franklin County, Tributary to McGehee Creek, (TGN, R4E, S26SW), 1 June 1992, T. Schiefer and R. Fontenot, 1 male, (NMNH).

Etymology.—Named for the Homochitto National Forest, collection locality for the species.

Remarks.—The streams of the Homochitto National Forest where the new species was collected are all small, clear, and sandy-bottomed, flowing through relatively undisturbed mixed hardwood forests.

Mayatrichia tuscaloosa, **new species**

(Fig. 13–16)

Diagnosis.—Although similar to *M. ponta* Ross in the structure of the inferior appendages with three heavy setae at the apex, *M. tuscaloosa* differs in the bracteoles being entire posteroventrally; a character which is shared with *M. illobia* Harris and Holzenthal and *M. ayama* Mosely. The new species is separated from the widespread *M. ayama* and *M. illobia*, which is only known from Costa Rica, on the basis of the rectangular inferior appendages.

Description.—Male: length 2.3–2.4 mm, antennae 18-segmented. Color brown in alcohol. Sternum VI with short posteromesal process. Segment VIII annular. Segment IX tapering anteriorly in lateral view; posterolateral processes (bracteoles) narrow; ventral margin straight, entire; dorsal margin rounded; in dorsal view, Tergum IX deeply emarginate posteriorly, line of setae at margin, anteriorly with shallow, rounded incision; in ventral view bracteoles elongate and narrow, curving inward distally. Tergum X membranous, rounded apically; in lateral view triangular, indistinct. Inferior appendages in lateral aspect wide basally, narrowing distally, each bearing elongate setae; in ventral view nearly parallel-sided, each with three teeth bearing stout, elongate setae. Subgenital plate with posteromesal process directed ventrad; in ventral view truncate, slightly emarginate mesally, bearing pair of small setae on posteromesal margin. Phallus long and narrow, apex with small, dorsal projection.

Female: unknown.

Type Specimens.—Holotype, male (CMNH): Alabama, Tuscaloosa County, Big Sandy Creek at 4.5 mi south of Coaling on an unnumbered county road, 20 March 1991, S. Harris and T. Shepard. Paratype: same, 1 male (NMNH).

Etymology.—Named for Tuscaloosa County, Alabama.

Remarks.—The species was found only in a single early spring collection. A

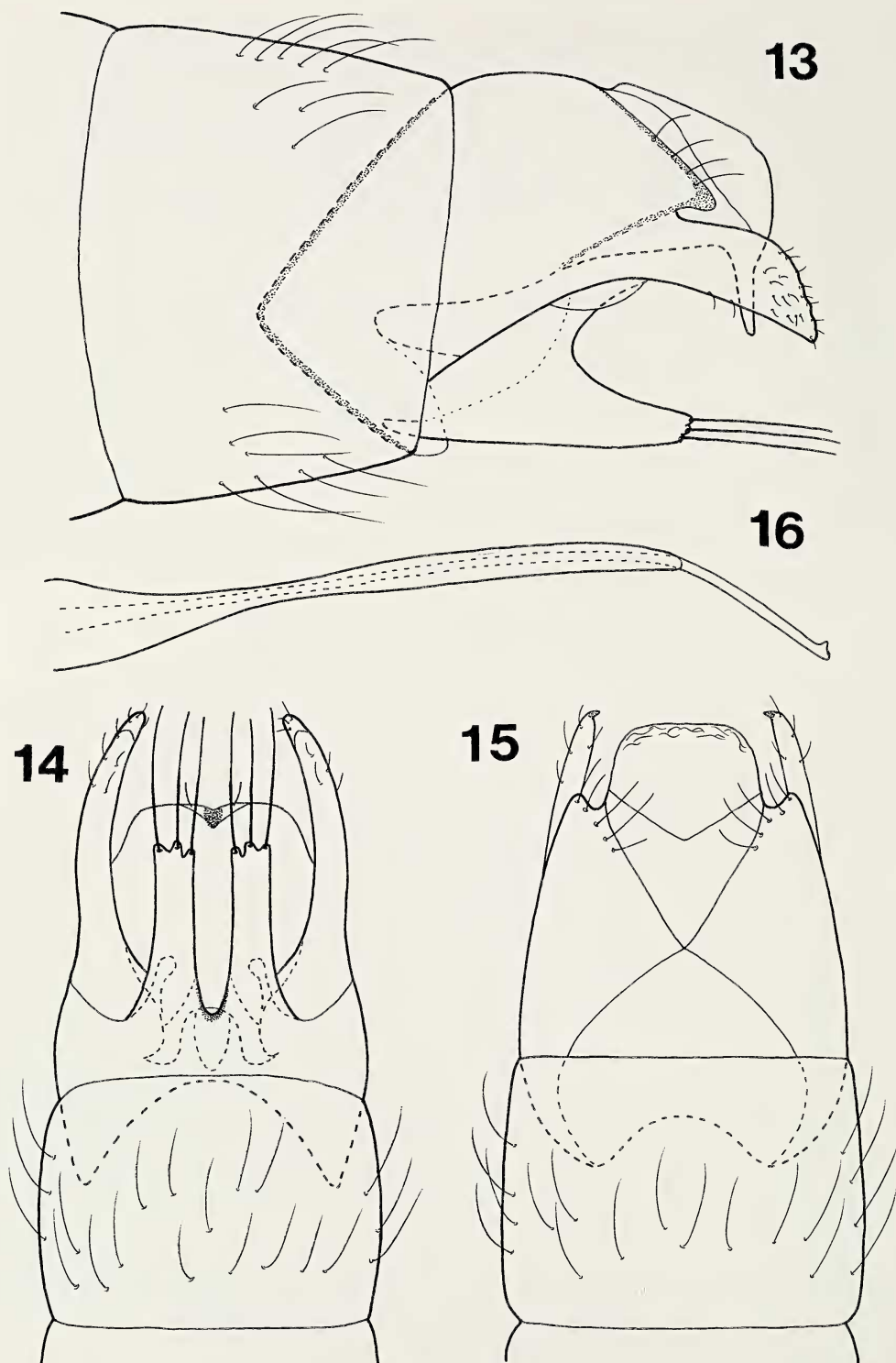


Fig. 13-16.—*Mayatrachia tuscaloosa* n. sp., male genitalia. 13, left lateral view; 14, ventral view; 15, dorsal view; 16, phallus, lateral view.

collection made the following night and monthly collections through October at the same site failed to collect additional specimens. Collections made in March and April of the following year were also unsuccessful. The collection locality was at the headwaters of Big Sandy Creek in a transition zone where the stream emerged from a springfed limestone region out onto the coastal plain.

ACKNOWLEDGMENTS

Mississippi specimens were obtained from Richard L. Brown of Mississippi State University and were collected as part of NSF grant BSR-9200856. West Virginia specimens were collected as part of contract DACW 59-92-M-0422 to JLS by the U. S. Army Corps of Engineers. The help of Tom Shepard of the Geological Survey of Alabama in the collection of the Alabama specimens is gratefully acknowledged.

LITERATURE CITED

- HARRIS, S. C. 1985. New microcaddisflies (Trichoptera: Hydroptilidae) from Alabama. *Proceedings of the Entomological Society of Washington*, 87:606–621.
- MARSHALL, J. E. 1979. A review of the genera of the Hydroptilidae (Trichoptera). *Bulletin of the British Museum of Natural History (Entomology)*, 39:135–239.
- MATHIS, M. L., AND D. E. BOWLES. 1990. Three new species of microcaddisflies (Trichoptera: Hydroptilidae) from the Ozark Mountains, U.S.A. *Proceedings of the Entomological Society of Washington*, 92:86–92.
- MORSE, J. C. 1993. A checklist of the Trichoptera of North America, including Greenland and Mexico. *Transactions of the American Entomological Society*, 119:47–93.